CITY OF RENTON
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2012 WSEC SINGLE FAMILY COMPLIANCE CHECKLIST

THIS CHECKLIST MUST BE COMPLETED FOR ALL SINGLE FAMILY AND DUPLEX NEW CONSTRUCTION AND ADDITIONS.

THIS CHECKLIST ALONG WITH THE APPROVED PLANS MUST BE KEPT ON THE JOB AT ALL TIMES. INSPECTORS CANNOT PERFORM INSPECTIONS WITHOUT IT.

1. **About this checklist:** This checklist is not as involved as it looks, because you only use portions of it for a particular dwelling project. This should be thought of as a tool for learning the residential Energy Code requirements.

   Requirements are grouped by foundation, framing, insulation, and final inspection phases. This not only lets you know what you need to do but also when the inspector will be checking for particular requirements. Use the checklist to choose compliance options that best suit the economics and design of your project.

   If you have questions, you may contact Jan Conklin at (425) 430-7276.

2. **Responsibility for information:** Although staff members will help you with general questions about completing this checklist, it is ultimately your responsibility to provide detailed information about heating systems, glazing, insulation, and other building specifications.

3. **Page 1, Credit Options:** Select a credit option. Besides meeting the basic requirements you must also include a credit in your home design.

4. **Pages 2 through 6:** Provide information as required but do not fill in the columns labeled "COMPLIANCE REQUIRED" or "INSPECTION APPROVED"**.**

   Since this checklist will be evaluated for completeness and accuracy, you can avoid unnecessary permit delays by carefully providing all required information. You may disregard items that don't address your particular building or equipment.

EFFECTIVE 7/1/2013

ALL RESIDENTIAL OCCUPANCIES

ALL FUEL TYPES

CHAPTER 6, PRESCRIPTIVE OPTIONS FOR SINGLE FAMILY AND DUPLEX OCCUPANCIES

INSTRUCTIONS:

1) Carefully review the requirements below. Your building must match these requirements without exceptions or substitutions.

SINGLE FAMILY AND DUPLEXES

GLAZING MAX:	
% OF FLOOR	Unlimited
U-FACTOR– VERTICAL	.30
U-FACTOR-Overhead (Skylights)	.50
DOOR U-VALUE	.20
CEILINGS:	
WITH ATTICS	R-49
VAULTED*see below	R-38
WALLS:	
ABOVE GRADE	R-21 INT*
BELOW GRADE	
INTERIOR	R-21 TB**
Or RIGID	R-15
EXTERIOR	R-10
FLOOR:	R-30
SLAB ON GRADE:	R-10

* Intermediate Framing – R-10 insulated headers
** R-5 Thermal Break Required
R-values are for wood frame assemblies only

*Single rafter or joist vaulted ceilings where both (a) the distance between the top of the ceiling and the underside of the roof sheathing is less than 12 inches and (b) there is a minimum of 1-inch vented airspace above the insulation.

CHAPTER 9 CREDITS: (See pages 7-8 for explanation)

- ☐ 1a EFFICIENT ENVELOPE(0.5)
- ☐ 1b EFFICIENT ENVELOPE(1.0)
- ☐ 1c EFFICIENT ENVELOPE(2.0)
- ☐ 2a Air Leakage Control (.5)
- ☐ 2b Air Leakage Control(1)
- ☐ 2c Air Leakage Control(1.5)
- ☐ 3a High Efficiency HVAC(.5)
- ☐ 3b High Efficiency HVAC(1)
- ☐ 3c High Efficiency HVAC(2)
- ☐ 3d High Efficiency HVAC(1)
- ☐ 4 High Efficiency Distribution(1.0)
- ☐ 5a EFFICIENT WATER HEATING1 (0.5)
- ☐ 5b EFFICIENT WATER HEATING2 (1.5)
- ☐ 6 RENEWABLE ELECTRIC ENERGY (0.5)

FOUNDATION PHASE

COMPLIANCE REQUIRED INSPECTION APPROVED

☐ ☐ 1) Slab insulation R10 required.
_____a. Exterior
_____b. Interior – from top of slab - 24” vertically or horizontally – 2” nailer allowed

☐ ☐ 2) Radiant Slab insulation R-10 required under whole slab.

☐ ☐ 3) Thermal break(s) shall be placed in the slab between conditioned and unconditioned space checked below:
_____a. dwelling/garage
_____b. dwelling/connected space
_____c. slab edge and foundation wall

MECHANICAL AND PLUMBING PHASE

☐ ☐ 4) Exhaust ventilation shall be provided for each dwelling unit as follows:

Location	**Minimum CFM** **Intermittent/Continuous**	**Manufacturer and Model#**	**CFM (.1 W.G.)**
Kitchen fan	100 CFM / 25 CFM		
Bathroom fan	65 CFM / 20 CFM		
Bathroom fan	65 CFM / 20 CFM		
Bathroom fan	65 CFM / 20 CFM		
Laundry fan	65 CFM / 20 CFM		
Whole house fan – Continuous Operation			
45 CFM (1-3 bedrooms, <1500 SF)			
60 CFM (2-4 bedrooms, <3000 SF)			
90 CFM (3-5 bedrooms, <4500 SF)			

Whole house fan required in all new houses/dwelling units and all additions >500 square feet

Whole house fan must be ultra quiet and must be labeled “Whole House Ventilation”

☐ ☐ 5) Whole house fan:
Location _____ Sone rating (.1W.G.)_____
a. Whole house fan must be readily accessible and operating instructions provided to occupant
b. Whole house fan shall be listed and labeled "for continuous use"
c. Whole house fan shall be labeled “Whole House Ventilation (see operating instructions)”

☐ ☐ 6) Mechanical exhaust fan ducts shall be ≥ 4" and properly sized.

☐ ☐ 7) Mechanical exhaust fan ducts shall be insulated to R-4 in unconditioned spaces.

☐ ☐ 8) Mechanical fresh air supply ducts shall be insulated to R-4 in conditioned spaces.

☐ 9) Heating system requirements will be met with the following:
Mfr. _____ Model # _____
Output _____ Fuel Type _____ Efficiency rating (AFUE)_____

☐ ☐ 10) Supply and return air ducts shall have sealed joints and seams in unconditioned spaces.
Tapes and mastics listed in accordance with UL181A or B – **NO DUCT TAPE PERMITTED**

☐ ☐ 11) HVAC plenums, supply, and return air ducts insulated to R-8.

☐ ☐ 12) Water heaters shall have:
a. Separate power, or gas shut-off
b. Non-compressible R-10 pad (electric in unheated spaces or on concrete floors)
c. Temperature setting of 120F

FRAMING PHASE

☐ 13) Glazing efficiency required shall be Maximum U-factor = .30 ☐

☐ 14) Window specifications: ☐

Manufacturer	U-Factor

☐ 15) Skylight specifications – Maximum U-factor = .50 ☐

# of Skylights	Manufacturer	Area	U-Factor

☐ 16) Window and door air leakage measures shall be met as follows: ☐
Exterior joints sealed, caulked, gasketed or weatherstripped

☐ 17) Insulation shall be placed in concealed places such as: ☐
1) Behind shower/tub
2) Behind partition studs/corners

☐ 18) Standard air leakage is complete and installed in the following: ☐
1) between sole plate/subfloors
2) wiring/plumbing/duct register penetrations
3) rim joists/mud sills (heated lower floors)
4) partition stud penetrations
5) around window/door frames

INSULATION PHASE

☐ 19) Exterior slab insulation shall be R-10 and approved for below grade use. ☐

☐ 20) Walls, including rim joists, shall be insulated to: ☐
☐ R-21 with Intermediate Framing – headers insulated with R-10

☐ 21) Interior below grade walls shall be insulated to: ☐
☐ R-21 with an R-5 thermal Break **OR**
☐ R-10 Rigid insulation on the exterior **OR**
☐ R-15 Rigid insulation on the interior

☐ 22) Skylight wall insulation equivalent to the wall R-values. ☐

☐ 23) Insulation baffles shall be placed in ceilings to maintain at least 1" ventilation space and extend 6" vertically above batts or 12" vertically above loosefill insulation. ☐

☐ 24) Vapor retarders shall be installed toward the warm surface and required to be rated at 1 perm dry cup or less ☐

Select one option for floors, walls, and ceilings:

Floors:

☐ Plywood w/exterior glue ☐ Poly ≥ 4 Mill ☐ Backed batts

Walls:

☐ Poly ≥ 4 Mill ☐ Face-stapled backed batts ☐ Vapor Retarder Paint (**not PVA**)

Ceilings: Not required where ventilation space > 12" above insulation

If less than 12": ☐ Face stapled backed batts ☐ Poly ≥ 4 Mill ☐ Vapor Retarder Paint (**not PVA**)

FINAL PHASE

FOR FINAL INSPECTION: COVERS TO BE REMOVED FROM EXHAUST FANS AND CAN LIGHTS SO INSPECTOR CAN VERIFY COMPLIANCE WITH CODE

☐ ☐ 25) Envelope floors shall be insulated to R-30

☐ ☐ 26) Ceilings with attic above shall be insulated to R-49

☐ ☐ 27) Single Rafter or Joist vaulted ceilings shall be insulated to R-38

☐ ☐ 28) Door systems shall meet:
☐ U-value = .20 (Metal insulated or fiberglass insulated only (wood doors do not meet this u-value)
Door #1: _____ #2) _____
One exempt door allowed: #3) _____

☐ ☐ 29) Fresh air shall be provided for each dwelling unit as follows:
☐ Tested, screened, controllable, through wall port
☐ Vented window frames
☐ Integrated with a Central forced air furnace which delivers outside makeup air through ducting system and requires furnace fan to be controlled by a timer set at 8 hours/day

☐ 30) Fresh air shall be provided for each dwelling unit as follows:
1) Each bedroom 3) Overall living area
2) Each Recreation Room 4) Other "habitable" rooms

☐ ☐ 31) Exposed foam insulation shall comply as follows:
Protected w/metal or plastic flashing that extends below grade
Be approved for subgrade, exterior use & properly installed.

☐ ☐ 32) Airflow between fresh air ports and whole house fan ensured by ½" undercut doors/grills.

☐ ☐ 33) Loosefill insulation OK if maximum ceiling slope not > 3 in 12 and there is ≥ 30" of clear distance from top of bottom chord to underside of roof sheathing at the roof ridge.

☐ ☐ 34) 6 mil black poly ground cover, lapped 12" at joints

☐ ☐ 35) Clearances shall meet listed, minimums between insulation and chimney

☐ ☐ 36) Attic hatch insulated to ceiling R-value and weather-stripped.

☐ ☐ 37) Attic access shall have wood dam to retain loose-fill insulation.

☐ ☐ 38) All exterior doors to be weather-stripped.

☐ ☐ 39) Heat pump thermostat shall have programmable capability.

☐ ☐ 40) Caulking is installed around light fixtures and flue penetrations.

☐ ☐ 41) Service hot & cold water piping to be insulated to R-4 in unconditioned spaces.

☐ ☐ 42) Service recirculation hot water piping shall be insulated per code.

☐ ☐ 43) Supply ducts shall have volume dampers to balance the system.

☐ ☐ 44) Programmable thermostat with a minimum 5-2 schedule for main HVAC system

☐ ☐ 45) Readily accessible, automatic or manual means provided to restrict or shut-off heating input to each zone or floor

☐ ☐ 46) Backup heat prohibits simultaneous operation of primary system.

☐ ☐ 47) Spot exhaust fans to have timer, dehumidistat, or switch.

☐ ☐ 48) Showers and lavatories shall limit flow to ≤ 2.5 gals per minute.

☐ ☐ 49) All fireplaces shall have:

a) 6 sq in comb. air supply duct with damper connected to fire box
b) Tight fitting ceramic glass or metal doors
c) Tight fitting flue damper

☐ ☐ 50) Solid fuel burning appliances shall have:
a) Tight fitting ceramic glass or metal doors
b) Outside combustion air source directly connected to fire box
c) Exceptions - see code

☐ 51) Recessed lighting fixtures shall be IC rated and labeled under ASTM E283 with tested air leakage < 2.0 CFM, no slots or holes in cans, caulked or sealed between can and ceiling

☐ ☐ 52) Indoor lighting shall be 50% compact fluorescent (pin based, or screw in) or T-8 or smaller lamps

☐ ☐ 53) All Outdoor lighting permanently mounted to a building shall be high efficacy. Or have a motion sensor and photo daylight control

PLAN REVIEWER APPROVAL: _____ DATE: _____

FINAL INSPECTION APPROVED:

INSPECTED BY: _____DATE:_____

Basic Changes to the 2012 Energy Code

Envelope Changes:

1. Window U-Factors are lower - Unlimited = U-.30 maximum

Mechanical Changes:

1. Blower door and duct testing required. **Must have certificate from testing agency showing test results.** Building leakage maximum = .00030. Duct is a calculated number which will be on energy code checklist.
2. Push to install furnace and ducts within the conditioned space. No duct testing required if this is the case.
3. Programmable thermostat with 5-2 schedule required.
4. Ventilation requirements went back to IMC – no State Code anymore.
5. Continuously operating whole house fan now the norm – lower CFM and even quieter.
6. Duct sealing and testing required when replacing or altering furnace/air conditioning.

Lighting Changes:

1. 75% of all fixtures must be high efficacy (lumen/watt ration) – fluorescent – but can be screw in.
2. Flourescent tubes must be T-8 or smaller.
3. Outdoor fixtures attached to the building must be pin based fluorescent. Or a motion sensor and photo daylight control.

And then the credits:

Small dwelling units less than 1500 sq ft and additions less than 750 sq ft are required to have .5 credit

Medium dwelling unit 1500 sq ft to 5000 sq ft are required to have 1.5 credit

Large dwelling unit greater than 5000 sq ft are required to have 2.5 credits

CHAPTER 9
ENERGY CREDITS (DEBITS)

OPTION	DESCRIPTION	CREDIT(S)

1a) **EFFICIENT BUILDING ENVELOPE 1:** **0.5**

Prescriptive compliance is based on Table 6-1, Option III with the following modifications: Window U .= 0.28 floor R-38, slab on grade R-10 full, below grade slab R-10 full.

or

Component performance compliance: Reduce the Target UA from Table 5-1 by 5%, as determined using EQUATION 1.1

1b) **EFFICIENT BUILDING ENVELOPE 2:** **1.0**

Prescriptive compliance is based on Table 6-1, Option III with the following modifications: Window U .= 0.25 and wall R-21 plus R-4 and R-38 floor, slab on grade R-10 full, below grade slab R-10 full, and R-21 plus R-5 below grade basement walls.

or

Component performance compliance: Reduce the Target UA from Table 5.1 by 15%, as determined using EQUATION 1.1

1c) **SUPER-EFFICIENT BUILDING ENVELOPE 3:** **2.0**

Prescriptive compliance is based on Table 6-1, Option III with the following modifications: Window U .= 0.22 and wall R-21 plus R-12 and R-38 floor, slab on grade R-10 full, below grade slab R-10 full and R-21 plus R-12 below grade basement walls and R-49 advanced ceiling and vault.

or

Component performance compliance: Reduce the Target UA from Table 5.1 by 30%, as determined using EQUATION 1.1

2a) **AIR LEAKAGE CONTROL AND EFFICIENT VENTILATION:** **0.5**

Reduce the tested air leakage to 4.0 air changes per hour maximum

and

All whole house ventilation requirements as determined by Section M1507.3 of the International Residential Code shall be met with a high efficiency fan, not interlocked with the furnace fan

2b) **AIR LEAKAGE CONTROL AND EFFICIENT VENTILATION:** **1.0**

Reduce the tested air leakage to 2.0 air changes per hour maximum

and

All whole house ventilation requirements as determined by Section M1507.38 of the International Residential Code shall be met with a heat recovery ventilation system with minimum sensible heat recovery efficiency of .70.

2c) **AIR LEAKAGE CONTROL AND EFFICIENT VENTILATION:** **1.5**

Reduce the tested air leakage to 1.5 air changes per hour maximum

and

All whole house ventilation requirements as determined by Section M1507.38 of the International Residential Code shall be met with a heat recovery ventilation system with minimum sensible heat recovery efficiency of .85.

3a) **HIGH EFFICIENCY HVAC EQUIPMENT 1:** **.5**

Gas, propane or oil-fired furnace or boiler with minimum AFUE of 95%,

3b) **HIGH EFFICIENCY HVAC EQUIPMENT 2:** **1.0**

Air-source heat pump with minimum HSPF of 8.5.

3c) Closed-loop ground source heat pump; with a minimum COP of 3.3. **2.0**

Or

Open loop water source heat pump with a minimum COP of 3.6

3d) **HIGH EFFICIENCY HVAC EQUIPMENT 3:** 1**.0**

DUCTLESS SPLIT SYSTEM HEAT PUMPS, ZONAL CONTROL:

In home where the primary space heating system is zonal electric heating, a ductless heat pump system shall be installed and provide heating to at least one zone of the housing unit.

4) **HIGH EFFICIENCY HVAC DISTRIBUTION SYSTEM:** **1.0**

All heating and cooling system components installed inside the conditioned space.
All combustion equipment shall be direct vent or sealed combustion.
Locating system components in conditioned crawl spaces is not permitted under this option.
Electric resistance heat is not permitted under this option.
Direct combustion heating equipment with AFUE less than 80% is not permitted under this option.

5a) **EFFICIENT WATER HEATING:** **.05**

Water heating system shall include one of the following:
Gas, propane or oil water heater with a minimum EF of 0.62.
or
Electric Water Heater with a minimum EF of 0.93.
and for both cases
All showerhead and kitchen sink faucets installed in the house shall meet be rated at 1.75 GPM or less. All other lavatory faucets shall be rated at 1.0 GPM or less.2

5b) **HIGH EFFICIENCY WATER HEATING:** **1.5**

Water heating system shall include one of the following:
Gas, propane or oil water heater with a minimum EF of 0.82.
or
Solar water heating supplementing a minimum standard water heater. Solar water heating will provide a rated minimum savings of 85 therms or 2000 kWh based on the Solar Rating and Certification Corporation (SRCC) Annual Performance of OG-300 Certified Solar Water Heating Systems.
or
Electric heat pump water heater with a minimum EF of 2.0.
Or
Water heater heated by ground source heat pump meeting the requirements of Option 3c.

6) **RENEWABLE ELECTRIC ENERGY:** **0.5**

For each 1200 kWh of electrical generation provided annually by on-site wind or solar equipment a 0.5 credit shall be allowed, up to 3 credits. Generation shall be calculated as follows:
For solar electric systems, the design shall be demonstrated to meet this requirement using the National Renewable Energy Laboratory calculator PVWATTs. Documentation noting solar access shall be included on the plans.
For wind generation projects designs shall document annual power generation based on the following factors:
The wind turbine power curve; average annual wind speed at the site; frequency distribution of the wind speed at the site and height of the tower.